

R sponse to Examiner's Remarks in Detailed Action

Reconsideration of the application is respectfully requested. The Application stands rejected as to all claims currently pending, on the basis of Miller, U.S. Patent 2,201,372 ("Miller") and of the combination of Harper, U.S. Patent No. 5,476,292 ("Harper") with Miller, as prior to the last Response by Applicant. In her last Action, the Examiner added a rejection based on obviousness for combination of Figure 1 and Miller. Applicant respectfully requests that the Examiner withdraw the rejections because the only Claims remaining in the Application include an element not addressed by the Examiner or the prior art – **namely, that the extractive force is distributed into a first component borne by the bell directly and a separate component borne by the gland, each of which is less than the extractive force as a whole.**

AUTHORIZATION FOR EXAMINER'S AMENDMENT. Applicant notes that because Claim 3 refers to reduction of forces, one of ordinary skill in the art would understand that the portion of forces "transferred to the bell" refers to forces borne by the bell directly, to the exclusion of forces borne initially by the gland and then transferred to the bell through the bolts. If the examiner feels that the term "directly" should be in the claims for clarity, Applicant hereby authorizes an examiner's amendment to insert the word "directly" in the third-to-last line of Claim 3, as in the following phrase: "...portion of an extractive force to said gland and a second portion of such force directly to the second pipe portion...". Applicant hereby requests any extensions of time necessary to render such an examiner's amendment timely, and the undersigned authorizes the charge of all fees therefor to Deposit Account 50-0954.

Claims 3 and 11 remain in this application. Claims 1, 2, 4-10, and 12-16 have been cancelled (without prejudice to file a divisional application). Applicant respectfully requests these cancellations be entered.

Claim Rejections, § 102 & 103

Re: Claim 2, 4-10, and 12-16: Claims 2, 4-10, and 12-16 are cancelled, without prejudice to Applicant's right to file a divisional application. Dependent claim 11 is now revised to depend from Claim 3.

Re: Claim 3:

The Examiner rejected Claim 3 over Miller, as well as over Miller in combination with Harper and separately in combination with Figure 1, without discussion of the limitation appearing at the end of claim 3:

“...transferring a first portion of an extractive force to said gland and a second portion of such force to the second pipe portion, which first portion and second portion are each of a magnitude less than the magnitude of the extractive force.”

Applicant respectfully urges that without identification of this limitation in Miller or other reference, the rejection is without basis under MPEP 2131, and should be withdrawn. This is not a new ground of argument. No new limitations are added to Claim 3 in this paper, and the same argument was previously lodged.

Support for the limitation is found in Claim 3 as filed, and in the Specification at Paragraphs 5 and 9 of the Detailed Description:

Para. 5: “Segment 1 is intended to grip spigot 10 and to translate separative forces into forces opposing and distributed between gland 11 and bell 12.”

Para. 9: “Due to contact with bell 12 in addition to gland 11, separative forces are transferred by segment 1, not just against gland 11 but also against bell 12. This is significant in that it reduces a potentially substantial force that is resisted by bolts 45. Under high loads, bolts 45 can actually tend to stretch, reducing sealing effectiveness of gasket 2; the current invention’s ability to transfer a portion of the magnitude of the separative vector to the bell therefore enhances the effectiveness of sealing.”

The limitation in Claim 3 describes that the axial extractive pressure is distributed into a two component force as it is transmitted through the segment. One of the two components can be drawn between a tooth of the segment and protrusion 17 (into the bell), while the other component is drawn through the elbow 3 (into the gland). The component of force directed through protrusion 17 and directly into the bell causes the bell to bear a portion of the extractive pressure directly, without transmission through the gland. This distribution of force may also create a controllable radial load of sufficient

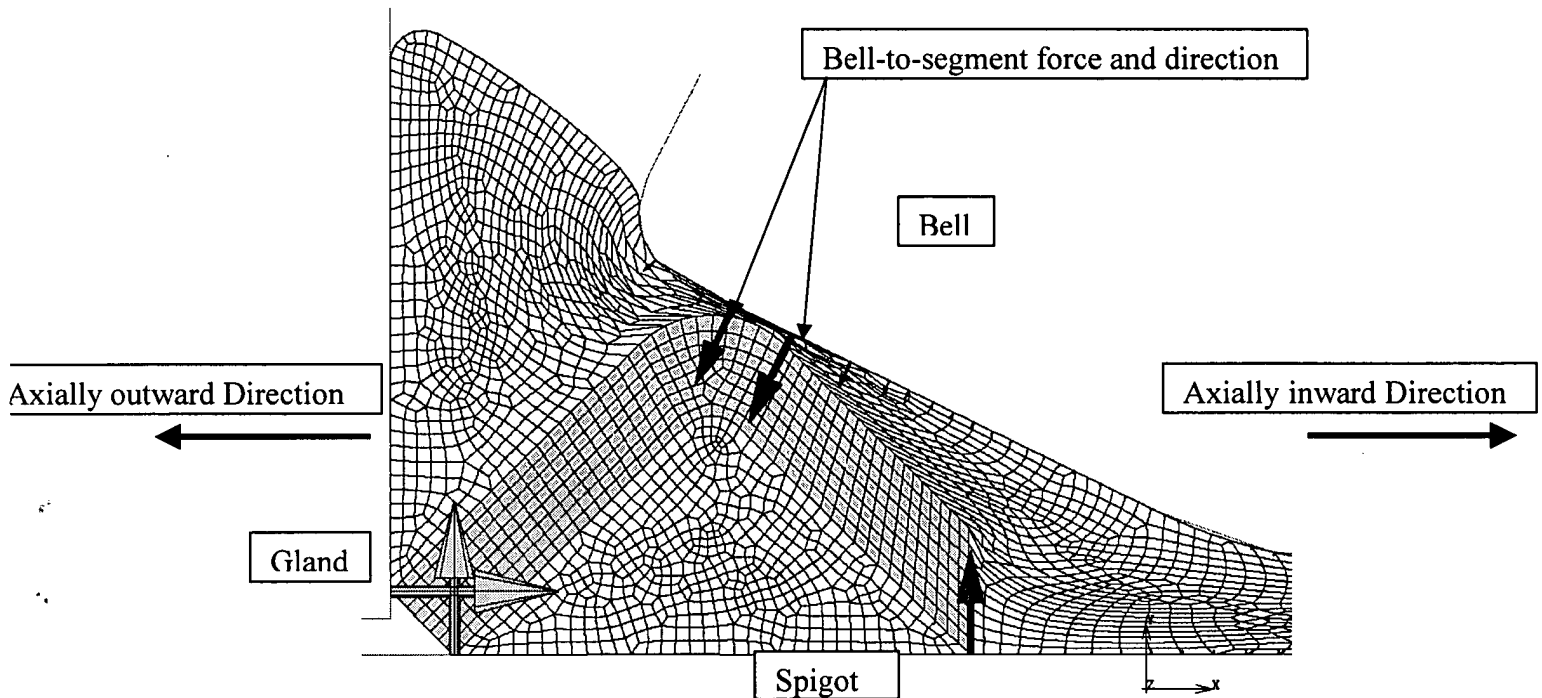
magnitude to ensure gripping of the spigot; but, because the gland bears a portion of the extractive force, that load can be maintained below the level at which prior art would puncture the spigot. No such limitation or teaching has been cited in the prior art.

Not only does the prior art not suggest this distribution-of-force limitation, but the Miller reference is incompatible with this limitation. Even limited technical analysis of the Miller reference demonstrates that the cited figure is unlikely to meet the limitation of Claim 3 by (1) transfer an axially resistive component of *any magnitude* directly to the bell, or (2) *reduce* the extractive force borne by the gland.

(1) Miller is incapable of transferring axially resistive force directly to the bell because Miller's bell cavity is sloped away from the spigot at a negative angle, leaving the locking segment shown without any ability to bite into the bell. Applicant specifically notes the radiused feature of the contact point between Miller's bell and segment; because of the configuration of the segment and the bell, movement in the axially extractive direction will immediately separate the segment and the bell, preventing any force-bearing function. Notably, Miller Figure 16 does not suggest or support a conclusion that any axial load is borne directly by the bell. In fact, Miller is quite clear in stating where the load path is directed – namely, through the gland (see p. 4, left column, lines 41-45). Where Miller intends to refer to resistance to axial movement, he does so clearly (see p. 4, left column, lines 34-41, which unmistakably refer to biting contact with the spigot “pipe”). Given this clarity in discussion of spigot-to-segment resistance, the entire lack of suggestion that the bell directly bears a load is significant. Applicant repeats its authorization for an examiner's amendment with respect to the addition of the term “directly” to claim 3, if necessary.

(2) To the extent that the Examiner would contend Miller teaches a compression among bell, spigot, and segment, Applicant does not disagree. Such compression, however, (a) results in a radial force between the segment and the bell, not an axially inward force exerted by the bell; and (b) is maintained solely by the presence of the gland pressing inward. Thus, the gland is bearing all of the extractive force. (See Miller, p.4,

left column, lines 41-45. Moreover, if the compression could have any effect on the axially extractive force, that effect can only *increase* the force directed against the gland, due to the resilience of the rubber and the resistance to such compression. This is illustrated by the free body diagram shown below (generated in a finite element analysis of Miller¹):



As seen in the diagram, the expected forces exerted by the bell on the segment urge the segment away from and axially out of the bell.

Forces of friction will not transfer a portion of the extractive force to the bell, because in Miller the bell surface is sloped away, allowing the segment and rubber to disengage, rather than slide. Further, even if some friction were present, the urge of the gasket under compression to return to its resting state will more than offset the minor effect of such friction, and prevent the conclusion that the force on the gland is less than the extractive force on the spigot. Under the rules of inherency, Miller does not teach any division of force (or effective reduction of force on the gland). The limitation is directly present in independent Claim 3.

¹ This diagram and the finite element analysis were commissioned by Applicant from a third party firm to evaluate the function of Miller. The techniques and software used are believed to be well known and accepted in the industry generally.

Re: Claim 11:

Claim 11 is not new, but its dependency is amended to rely on Claim 3. Applicant also revises the wording as shown on page 2 of this paper for clarity to specify that the multiple density regions are in the gasket.

Drawings

1. The legend "Prior Art" is added to Figure 1.
2. Applicant has revised Figure 4 to show the compression gland advanced by tightening of the bolts, which renders the lip within the longitudinal extremes of the bell of the female pipe. Support for this change is present in Figure 7 as filed (which shows the lip within the bell, in a different embodiment) and at paragraph 5 of the Specification as filed.
3. The Examiner requires correction of the use of reference character "1," which appears in the unamended drawings to refer to both the locking segment and to portions of the gasket 2. Applicant has corrected this error by removing reference character 1 and its lead line from Fig. 1.
4. The proposed drawing correction is attached as an appendix hereto.
5. Formal drawings will be provided prior to payment of the issue fee if allowance is granted.

§ 112 Issues

The Examiner objected to Claims 2, 4-11, and 16 because it was unclear from Figures 1-6 how the lip of the gland was partially within the female pipe portion. Applicant respectfully notes that Figure 7 has from the time of filing included a lip within the actual boundaries of the bell. Moreover, Applicant has cancelled Claims 2, 4-10, and 12-16, and revised the remaining dependent claim 11 to depend from Claim 3, instead. Claim 3 does not include the limitation that the lip be within the bell, nor does Claim 11 add such a limitation. Accordingly, this objection is obviated even if the submitted drawings are not acceptable.

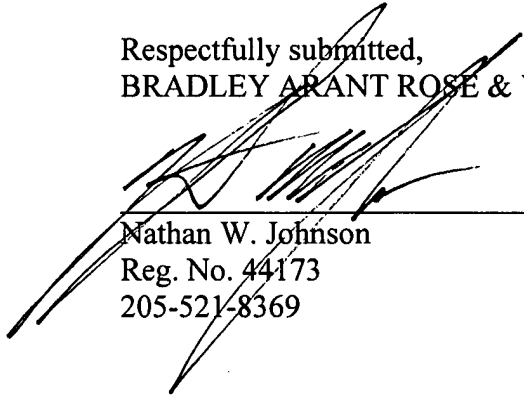
Fees

This response is timely and no fees or extensions are required.

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Response Dated February 10, 2004
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Applicant has diligently sought to comply with all requirements and to correct all informalities and objections. The Application is believed to be in condition for allowance, and a timely Notice of Allowance is respectfully requested.

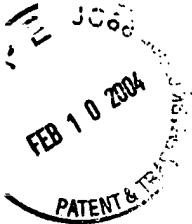
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ATTACHMENTS



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PROPOSED CORRECTIVE DRAWINGS

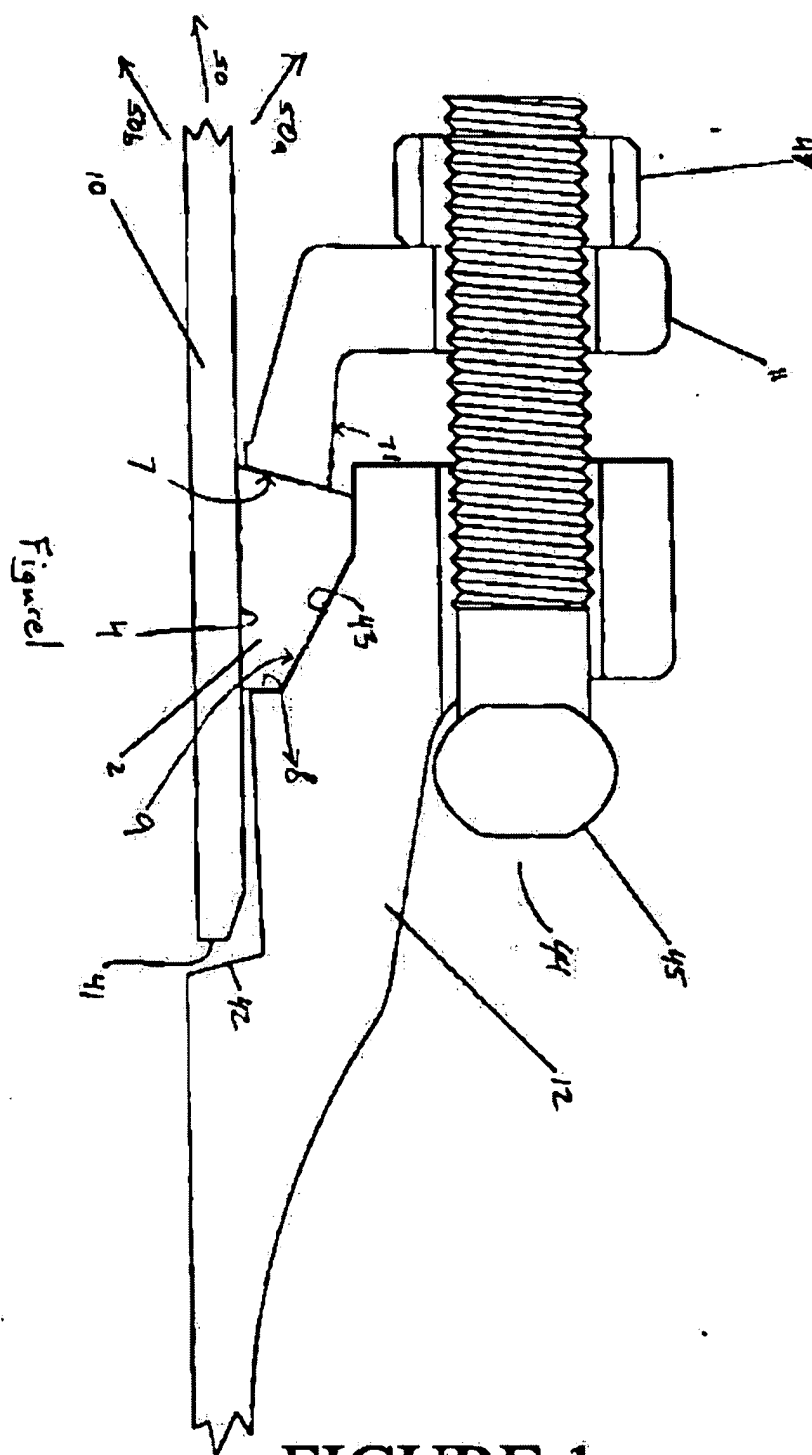


FIGURE 1
PRIOR ART

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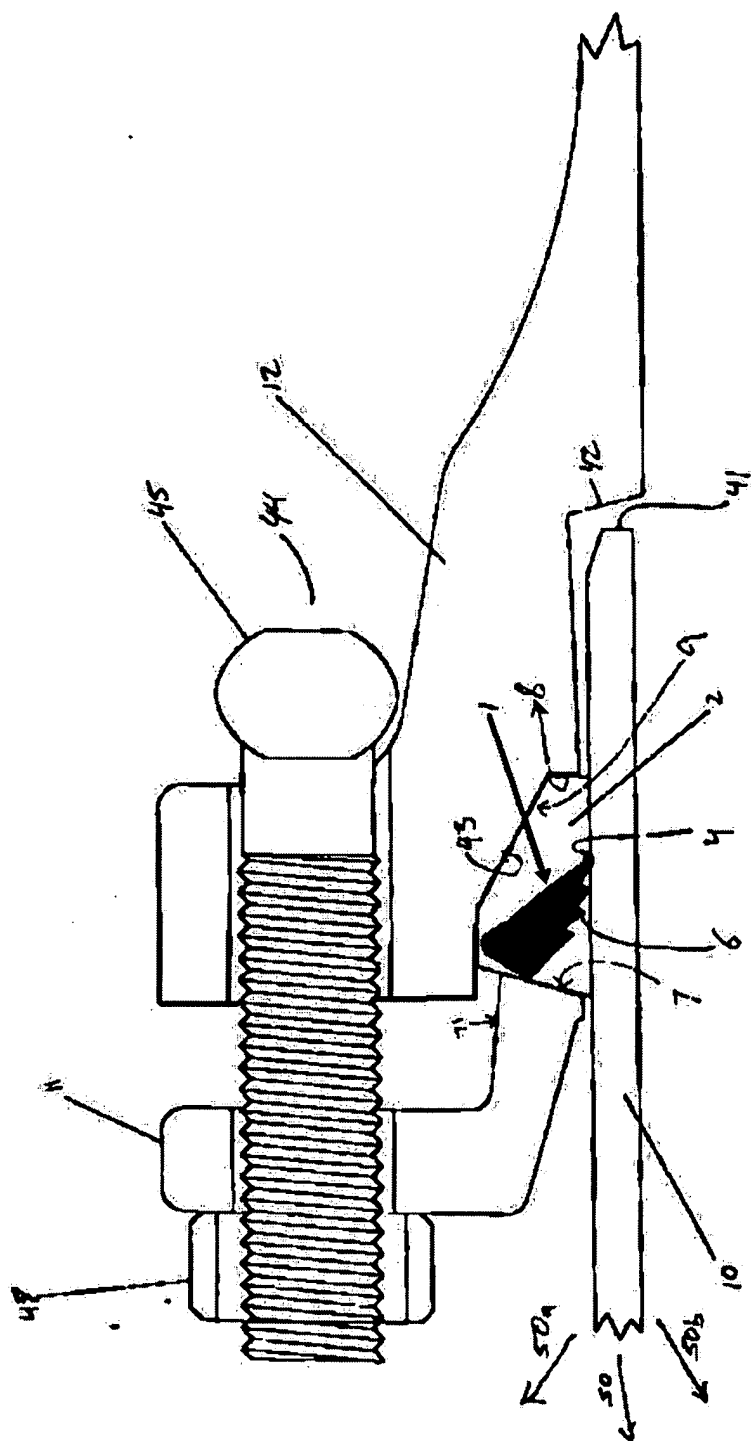


FIGURE 4

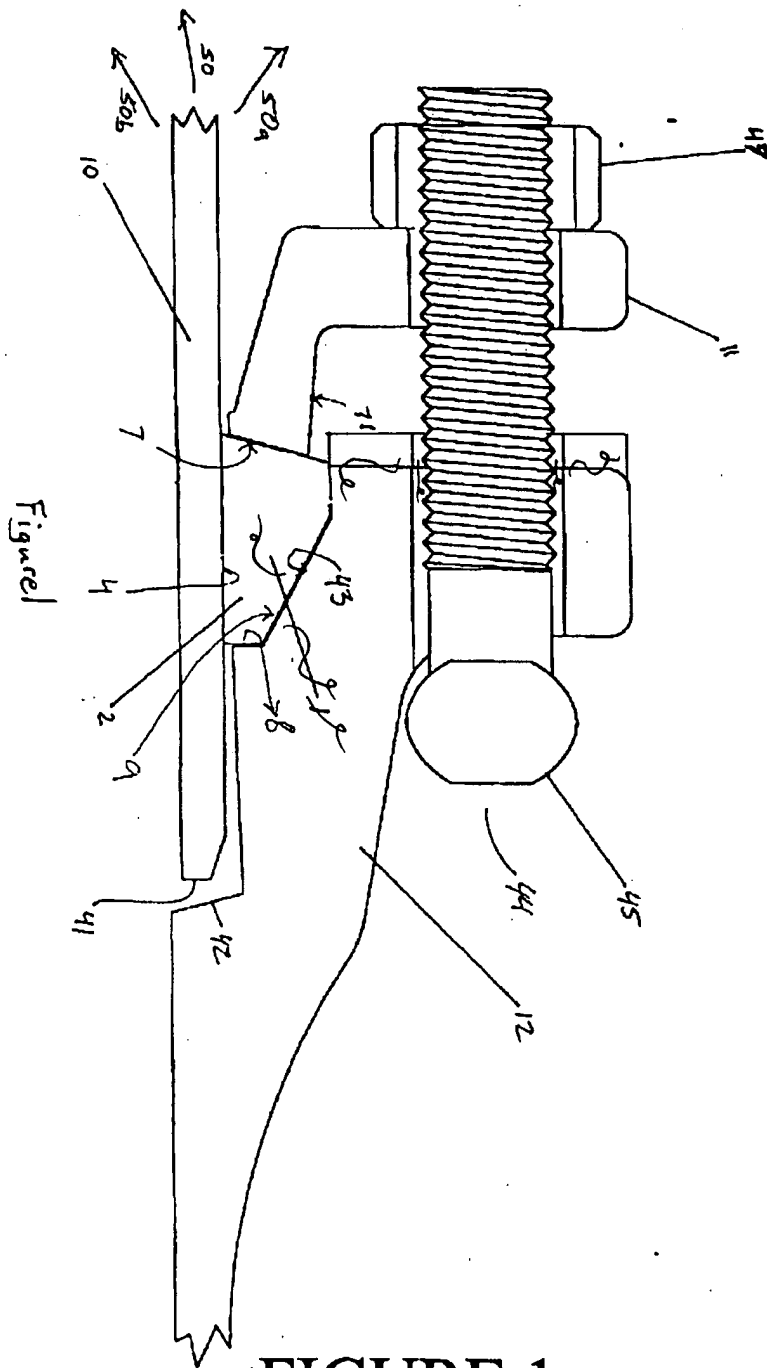
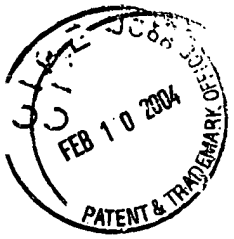


FIGURE 1

PRIOR ART

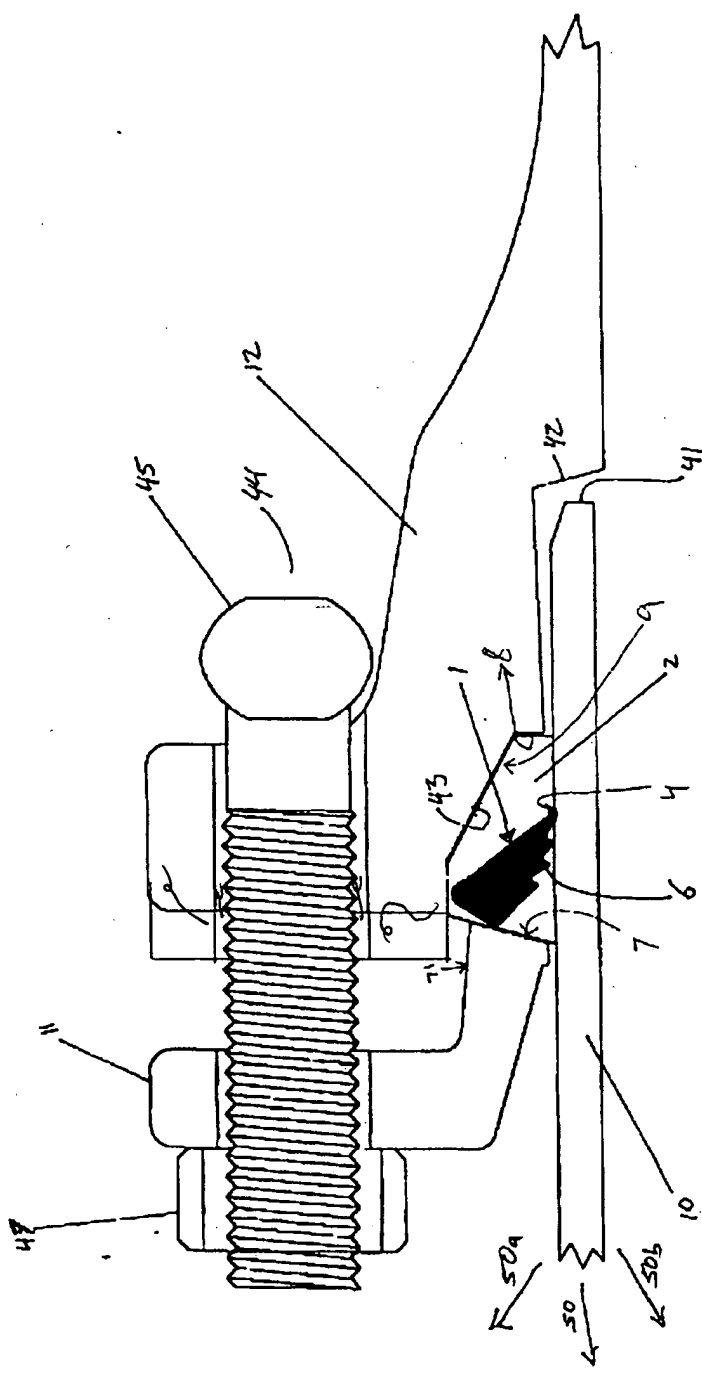


FIGURE 4